Interview Summary

On March 29, 2005, Applicant's representative participated in a telephonic interview with Examiner Forman. Applicant would like to thank Examiner Forman for taking the time for the interview. Amendments to the claims that would simplify the claim structure and clarify the subject matter of Applicant's invention were discussed. It was agreed that Applicant would file a response amending the claims and identifying support for the amendments. No agreement was reached on specific claim language.

Remarks

A. Status of the Claims

Claims 1, 6-10, 12, 15, 19-22, 24, 25, and 28 were pending at the time of the Official Action. Claims 1, 6-10, 12, 15, 19-22, 24, 25, and 28 have been canceled. New claims 29-43 have been added. Thus, claims 29-43 are currently pending.

No new matter has been added with these amendments. Support for new independent claim 29 can be found in the specification at, for example, page 11, lines 9-19; page 12, lines 1-5; page 14, lines 13-17; and page 20, line 20 – page 21, line 4. Support for the new dependent claims can be found in the specification as follows: claim 30 (p. 13, ln. 14 – p. 14, ln. 2); claim 31 (p. 11, ln. 19 – p. 20, ln. 1); claim 32 (p. 12, ln. 1-5); claim 33 (p. 14, ln. 18 – p. 15, ln. 1); claim 34 (p. 14, ln. 18 – p. 15, ln. 1); claim 35 (p. 13, ln. 5-8); claim 36 (p. 13, ln. 4-5); claim 37 (p. 14, ln. 7-9); claim 38 (p. 13, ln. 8-10); claim 39 (p. 13, ln. 8-10); claim 40 (p. 20, ln. 20 – p. 21, ln. 1); claim 41 (p. 13, ln. 10-12); claim 42 (p. 13, ln. 10-12); claim 43 (p. 13, ln. 12-13).

B. Rejections Under 35 U.S.C. § 102

Claims 1, 6-10, 12, 15, 19, 25, and 28 were rejected under § 102(e) as being anticipated by Stanton (U.S. Patent No. 6,680,377). Applicant traverses this rejection.

Applicant submits that currently pending claims 29-42 are novel over Stanton. The

method of the presently claimed invention comprises a step of providing a signaling aptamer comprising a reporter molecule covalently coupled to an aptamer, wherein in the aptamer's unbound state the optical signal produced by the reporter molecule *is quenched by the aptamer's conformation* relative to the optical signal produced by the reporter molecule when the aptamer undergoes a conformational change upon binding to its ligand.

In contrast, Stanton discloses bioengineered aptamer beacons. It appears that Stanton bioengineers selected aptamers by modifying the primary sequence of the aptamer such that the aptamer can form alternate secondary and/or tertiary non-binding conformations (*see* col. 9, ln. 25-30). It then appears that after the aptamers are bioengineered, a reporter *group*, such as a fluorescent molecule and quencher pair, are added (col. 10, ln. 46-51). In other words, in the aptamer beacon's non-binding conformation it is an appended quencher molecule that quenches the signal from the fluorescent molecule.

According to the presently claimed invention the differential optical signal produce by the reporter molecule is a result of the conformation of the aptamer itself, and not the result of a separate quencher molecule. The working examples provided in the present specification demonstrate that a ligand-dependent differential optical signal can be produced by a signaling aptamer in which a single reporter molecule has been covalently appended. The present invention has the further advantage of not requiring the modification of the aptamer's primary sequence by adding further oligonucleotide sequences, in order for the aptamer to form alternate secondary or tertiary non-binding conformations.

For example, the signaling aptamer ATP-R-Ac13 has a single acridine moiety introduced in the place of the adenosine at position 13 of the aptamer (see p. 21, ln. 16-18, and FIG. 2A). The signaling aptamer DFL7-8 has a single fluorescein molecule inserted between residues 7 and 8 of the aptamer (see p. 21, ln. 18 to p. 22, ln. 2, and FIG. 2B). As can be seen from the description of the preparation of these aptamers, quencher molecules were not incorporated into their sequences nor were additional oligonucleotide sequences added to cause the formation of alternate secondary or tertiary non-binding conformations (see *e.g.*, p 17, ln. 1 to p. 18, ln. 10; p. 20, ln. 13 to p. 22, ln. 8; and FIGs. 2A and 2B). The ATP-R-Ac13 and DFL7-8 aptamers showed marked increases in fluorescence intensity in the presence of their ligand (p. 22, ln. 6-8). Thus,

the aptamers of the presently claimed invention do not require a separate quencher molecule appended to the aptamer to mediate the optical signal produced by the reporter molecule.

For the reasons described above, the Action does not establish that Stanton teaches all of the elements of claims 29-43. Applicant, therefore, respectfully requests the withdrawal of this rejection.

C. Rejections Under 35 U.S.C. § 103

Claims 20-22 and 24 were rejected under § 103(a) as being unpatentable over Stanton (U.S. Patent No. 6,680,377) in view of Szostak (U.S. Patent 5,631,146). The Action states that Stanton does not teach anti-adenosine aptamers as in claims 20-22 and 24. The Action asserts, however, that Szostak teaches anti-adenosine aptamers, and that it would have been obvious to apply the anti-adenosine aptamers of Szostak to the target detection method of Stanton. Applicants traverse this rejection.

As set forth in the preceding section, the Action does not establish that Stanton teaches all of the elements of the method recited in independent claim 29. Thus, regardless of whether it would have been obvious to apply the anti-adenosine aptamers of Szostak to the target detection method of Stanton, the Action still fails to establish that these references teach or suggest all of the elements of claims 29-43. Applicant, therefore, respectfully requests the withdrawal of this rejection.

D. Conclusion

In view of the above, Applicant submits that all of the claims are in condition for allowance. The Examiner is invited to contact the undersigned attorney at (512) 536-3055 with any questions, comments, or suggestions relating to the referenced patent application.